1.(Previously Presented)   An adaptive equalizer comprising:

a decision device producing a decision device output;

a decision feedback equalizer coupled to the decision device, the decision feedback equalizer producing a decision feedback output;

an FIR filter coupled to the decision device; and

a trellis decoder coupled to the decision device, the trellis decoder producing a reliability output and a decoded output;

wherein an error signal is generated by subtracting the decision feedback output from the decision device output, the error signal being used to update coefficients of the taps of the FIR filter and the decision feedback equalizer; and

wherein a magnitude of the change to the coefficients is selected based at least in part on the reliability output of the trellis decoder.

2. (Previously Presented)   The adaptive equalizer of claim 1, wherein the decision device is a slicer.

3. (Previously Presented)   The adaptive equalizer of claim 1, wherein the trellis decoder is a Viterbi decoder.

4. (Previously Presented)   The adaptive equalizer of claim 3, wherein the reliability output is determined by generating a soft output from each decoding stage of the Viterbi decoder, each soft output being equal to a difference between an accumulated metric of a survive path and a deleted path for the decoding stage, the soft output of a final decoding stage being used as the reliability

output.

5. (Previously Presented)   The adaptive equalizer of claim 4, wherein the decision device is a

slicer.

6. (Cancelled)

7. (Previously Presented)   An adaptive equalizer comprising:

    a decision device;

    an FIR filter coupled to the decision device;

    a decision feedback equalizer coupled to the decision device, the decision feedback equalizer

producing a decision feedback output;

    a trellis decoder coupled to the decision device, the trellis decoder producing a reliability

output and a decoded output;

    wherein an error signal is generated by delaying the decision feedback output and subtracting

it from the decoded output; and

    wherein a magnitude of change in coefficients of the taps of the FIR filter and the decision

feedback equalizer is selected based at least in part upon the reliability output.

8. (Previously Presented)   The adaptive equalizer of claim 7, wherein the decision device is a

slicer.

9. (Previously Presented)   The adaptive equalizer of claim 7, wherein the trellis decoder is a

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Viterbi decoder.

10. (Cancelled)

11. (Cancelled)

12. (Currently Amended)   An adaptive equalizer having a plurality of coefficients adapted to

provide an equalizer response, the adaptive equalizer comprising:

an equalizer output providing an equalizer output signal;

a decision device having:

a decision device input operably coupled to the equalizer output; and

a decision device output producing a decision device output signal;

a decision feedback equalizer comprising:

a decision feedback equalizer input operably coupled to the decision device output;

and

a decision feedback equalizer output operably coupled to the decision device input;

an FIR filter comprising:

an FIR input receiving an information-bearing signal; and

an FIR output operably coupled to the decision device input; and

a decision error signal created by operably combining the equalizer output signal and

the decision device output signal;

an error-correction decoder comprising:

an error-corrected symbol output producing an error-corrected symbol output signal;

and

a symbol reliability output producing a symbol reliability signal related to the decision error signal;

a reliability-decision directed adaptation signal created by operably combining the decision error signal with the symbol reliability output signal;

a-means for adapting the plurality of coefficients of the adaptive equalizer;

wherein the reliability decision-directed adaptation signal is coupled operatively to said means for adapting the coefficients of the adaptive equalizer; and

wherein the coefficients of the adaptive equalizer are dependent, at least in part, upon the symbol reliability output of the error-correction decoder.

10
13. (Currently Amended)   The adaptive equalizer of claim 12, wherein the error-correcting decoder comprises is-a trellis decoder.

11
14. (Previously Presented)   The adaptive equalizer of claim 12, wherein the received information-bearing signal is in an ATSC signal.

12
15. (Previously Presented)   The adaptive equalizer of claim 12, wherein the received information-bearing signal is broadcast as a QAM signal.

13
16. (Previously Presented)   The adaptive equalizer of claim 12, wherein the received information-bearing signal is broadcast as an offset QAM signal.

14

17. (Currently Amended)   An adaptive equalizer having a plurality of coefficients adapted to provide an equalizer response, the adaptive equalizer comprising:

an equalizer output providing an equalizer output signal;

a decision device comprising:

a decision input operably coupled to the equalizer output; and

a decision output producing a decision device output signal;

a decision feedback equalizer comprising:

a decision feedback equalizer input operably coupled to the decision output; and

a decision feedback equalizer output operably coupled to the decision device input;

an FIR filter comprising:

an FIR input; and

an FIR output operably coupled to the decision device input; and

an error-correcting decoder comprising:

an error-corrected symbol output producing an error-corrected symbol output signal;

a symbol reliability output producing a symbol reliability output signal; and an error-correcting decoder input operably coupled to the decision ~~device~~ input ~~signal~~;

a symbol mapper operably coupled to the error-corrected symbol output signal and providing a mapped and scaled symbol output signal;

a decision error signal created by operably combining the equalizer output signal and the mapped and scaled symbol output signal;

a reliability-decision directed adaptation signal created by operably combining the decision error signal with the ~~output of the~~ symbol reliability output;

~~a~~ means for adapting the coefficients of the adaptive equalizer;

- 6 -

wherein the reliability decision-directed adaptation signal error signal is operably coupled to said means for adapting the coefficients of the adaptive equalizer; and

wherein a magnitude of a change to the coefficients is dependent, at least in part, upon the symbol reliability output of the error-correction decoder.

15
18. (Currently Amended)   The adaptive equalizer of claim 17, 14 wherein the error-correcting decoder comprises is-a trellis decoder.

16
19. (Previously Presented)   The adaptive equalizer of claim 17, 14 wherein a received information-bearing input signal is in an ATSC signal.

17
20. (Previously Presented)   The adaptive equalizer of claim 17, 14 wherein a received information-bearing input signal is broadcast as a QAM signal.

18
21. (Previously Presented)   The adaptive equalizer of claim 17, 14 wherein a received information-bearing input signal is broadcast as an offset QAM signal.

19
22. (Currently Amended)   A method for creating a reliability-decision directed adaptation signal for adapting an adaptive equalizer receiving an information bearing signal, and where the adaptive equalizer comprises:

    an equalizer output signal;

    an error-corrected symbol output signal related to the equalizer output signal; and

    a symbol reliability signal related to the error-corrected symbol output signal;

the method for creating the reliability-decision directed adaptation signal comprising the steps of:

(a) combining operatively the error-corrected symbol output signal and the equalizer output signal to produce a decision error signal; and

(b) combining operatively the decision error signal and the symbol reliability signal to produce the reliability-decision directed adaptation signal.

20

23. (Currently Amended)   The method of ~~claim 22,~~ claim *19* further comprising the step of:

(c) passing the received information-bearing signal through the adaptive equalizer to form the equalizer output signal.

21

24. (Previously Presented)   The method of claim 23 *20*, wherein the received information-bearing signal is in an ATSC signal.

22

25. (Previously Presented)   The method of claim 23 *20*, wherein the received information-bearing signal is broadcast as a QAM signal.

23

26. (Previously Presented)   The method of claim 23 *20*, wherein the received information-bearing signal is broadcast as an offset QAM signal.

24

27. (Previously Presented)   The method of claim 23 *20*, further comprising the steps of:

(d) decoding the equalizer output signal to produce a decoded symbol; and

(e) error-correcting the decoded symbol to produced the error-corrected symbol output signal.

28. 25 (Previously Presented)   The method of claim 27 24, wherein the error-corrected symbol output signal is formed by passing the decoded symbol through a trellis decoder.

29. 26 (Previously Presented)   The method of claim 23 20, the further comprising the steps of:

(d)   decoding the equalizer output signal to produce a decoded symbol; and

(e)   error-correcting the decoded symbol to form the error-corrected symbol output signal and the symbol reliability signal, wherein the symbol reliability signal is derived from a metric produced in conjunction with the error-correcting step.

30. 27 (Previously Presented)   The method of claim 29 26, wherein step (e) further comprises the steps of:

(e.1)   passing the decoded symbol through a trellis decoder;

(e.2)   generating a soft output from each decoding stage of the trellis decoder, wherein the soft output is equal to a difference between an accumulated metric of a survive path and a deleted path for the respective decoding stage; and

(e.3)   using the soft output of a final decoding stage as a reliability output to form the symbol reliability signal corresponding to the error-corrected symbol output signal.

31. 28 (Currently Amended)   A method for adapting an adaptive equalizer comprising a plurality of coefficients and a means for adapting the plurality of coefficients, wherein the means for adapting the plurality of coefficients includes a step size, the method comprising the steps of:

(a)   passing a received information-bearing signal through an adaptive equalizer to

produce an equalizer output signal;

(b)   decoding the equalizer output signal to produce a decoded symbol signal;

(c)   error-correcting the decoded symbol signal to produce an error-corrected decoded symbol signal and a symbol reliability signal, wherein the symbol reliability signal is related to the likelihood that the error-corrected decoded symbol signal is error free; (d) modifying the plurality of coefficients in response to the symbol reliability signal; and

(e)   modifying the step size ~~of the means for adapting the plurality of coefficients~~ in relation to a magnitude of the symbol reliability signal.

32. (Cancelled)

~~33~~. 29 (Currently Amended)   The method of claim ~~31~~ 28, ~~wherein the method~~ further comprising the steps of:

(e)   operably combining the equalizer output signal and the error-corrected decoded symbol signal to form a decision error signal;

(f)   using the symbol reliability signal to scale the decision error signal to form a reliability-decision directed adaptation signal; and

(g)   using the reliability-decision directed adaptation signal to control the means for adapting the coefficient of the adaptive equalizer.

~~34~~. 30 (Previously Presented)   The method of claim ~~31~~ 28, further comprising the steps of:

(e)   mapping the error-corrected decoded symbol signal to form a mapped output symbol

signal;

(f)   operably combining the equalizer output signal and the mapped output symbol signal to form a decision error signal;

(g)   using the symbol reliability signal to scale the decision error signal to form a reliability-decision directed adaptation signal; and

(h)   using the reliability-decision directed adaptation signal to control the means for adapting the coefficients of the adaptive equalizer.

31
35. (Previously Presented)   The method of claim 34, wherein the means for adapting the plurality of coefficients comprises a step size, the method further comprising the step of:
30

(i)   using the reliability-decision directed adaptation signal to adjust the magnitude of the step size.

32
36. (Currently Amended)   An adaptive equalizer for receiving an information bearing signal, the adaptive equalizer comprising:

a plurality of coefficients governing a response of the adaptive equalizer;

a-means for modifying said plurality of coefficients of the adaptive equalizer, the means for modifying the plurality of coefficients further including a step size; and

an error-correcting decoder providing a symbol reliability signal, wherein said symbol reliability signal is coupled operatively to the means for modifying said coefficients, and wherein said symbol reliability signal is operably coupled to the step size; and

whereby,

a magnitude of the symbol reliability signal is used to adapt the plurality of coefficients, and

wherein the magnitude of the adaptation applied to the plurality of coefficients is governed by the symbol reliability signal.

37. (Canceled)

33
38. (Previously Presented)   The adaptive equalizer of claim 36, wherein the adaptive equalizer 32 further comprises:

a decision error signal operably combined with the symbol reliability signal to form a reliability-decision directed adaptation signal;

wherein the reliability-decision directed adaptation signal is operatively coupled to the means for modifying said plurality of coefficients; and

whereby, the coefficients are adapted in response to the reliability-decision directed adaptation signal.

34
39. (Currently Amended)   A method for creating a reliability-decision directed adaptation signal for adapting an adaptive equalizer receiving an information bearing signal, the adaptive equalizer comprising:

an equalizer output signal;

a decision device output signal; and

a symbol reliability signal related to the decision device output signal;

the method for creating the reliability-decision directed adaptation signal comprising the steps of:

(a) operably combining the decision device output signal and equalizer output signal to create a decision error signal; and

(b) operably combining the decision error signal and the symbol reliability signal to produce the reliability-decision directed adaptation signal.

35
40. (Previously Presented)   The method of claim 39, 34 further comprising the steps of:

(c)   mapping an error-corrected symbol output to produce a mapped symbol output; and

(d)   subtracting the equalizer output signal from the mapped symbol output to produce the decision error signal.

36
41. (Previously Presented)   The method of claim 40, further comprising the steps of:

(e)   developing a metric corresponding to the confidence that a decoder device output signal is error free; and

(f)   using the metric to create the symbol reliability signal related to the decoder device output signal.

37
42. (Previously Presented)   The method of claim 39, 34 wherein step (b) further comprises the steps of:

(b.1)   passing the decoded symbol through a trellis decoder;

(b.2)   generating a soft output from each decoding stage of the trellis decoder, each soft output being equal to the difference between an accumulated metric of a survive path and a deleted path for the decoding stage; and

(b.3)   using the soft output of a final decoding stage as the reliability output to form the symbol reliability signal corresponding to the error-corrected symbol output.

38

43. (Currently Amended)   A method for adapting a response of an adaptive equalizer receiving an information-bearing signal, the adaptive equalizer comprising:

a plurality of coefficients; and

a-means for modifying the plurality of coefficients;

the method for adapting the adaptive equalizer comprising the steps of:

(a)   passing the information-bearing signal through the adaptive equalizer to produce an equalizer output signal;

(b)   decoding the equalizer output signal to produce a decoder symbol signal;

(c)   error-correcting the decoder symbol signal to produce an error-corrected decoder symbol signal;

(d)   developing a metric related to a confidence that the error-corrected decoder symbol signal is error free;

(e)   using the metric to produce a symbol reliability signal related to the error-corrected decoder symbol;

(f)   forming a reliability-decision directed adaptation signal related to said error-corrected decoder symbol signal by operably combining the equalizer output signal, error-corrected decoder symbol signal and the symbol reliability signal; and

(g)   using the reliability-decision directed adaptation signal to control the means for modifying the plurality of coefficients, whereby the adaptive equalizer is adapted.

39

44. (Previously Presented)   The method of claim 43, **38** wherein step (f) further comprises the steps of:

(f.1)   operably combining the equalizer output signal and error-corrected decoder symbol

signal to produce a decision error signal related to said equalized output signal; and

(f.2)   operably combining the decision error signal and the symbol reliability signal to produce the reliability-decision directed adaptation signal.

45. (Previously Presented)   The method of claim 43, wherein, step (f) further comprises the steps of:

(f.1)   mapping and scaling the error-corrected decoder symbol signal to create a mapped and scaled error-corrected symbol signal;

(f.2)   subtracting operably the equalized output signal from the mapped and scaled error-corrected symbol signal to produce the decision error signal related to said equalized output signal; and

(f.3)   using the symbol reliability signal to scale the decision error signal to form the reliability-decision directed adaptation signal.

46. (Previously Presented)   The method of claim 45, wherein the received information-bearing signal is in an ATSC signal.

47. (Previously Presented)   The method of claim 45, wherein the received information-bearing signal is broadcast as a QAM signal.

48. (Previously Presented)   The method of claim 45, wherein the received information-bearing signal is broadcast as an offset QAM signal.

44

49. (Currently Amended)   A method for adapting the response of an adaptive equalizer, the adaptive equalizer receiving an information-bearing signal, the adaptive equalizer comprising:

a plurality of coefficients; and

a means for modifying the plurality of coefficients;

the method for adapting the adaptive equalizer comprising the steps of:

(a)   passing the information-bearing signal through the adaptive equalizer to produce an equalizer output signal;

(b)   decoding the equalizer output signal to produce a decoder symbol signal;

(c)   error-correcting the decoder symbol signal to produce an error-corrected decoder symbol signal;

(d)   developing a metric related to a likelihood that the error-corrected decoder symbol signal is error free;

(e)   using the metric to produce a symbol reliability signal related to the error-corrected decoder symbol;

(f)   forming a reliability-decision directed adaptation signal related to said error-corrected decoder symbol signal by operably combining the equalizer output signal, the error-corrected decoder symbol signal and the symbol reliability signal; and

(g)   using the reliability-decision directed adaptation signal to control the means for modifying the plurality of coefficients, whereby the adaptive equalizer is adapted.

45   44

50. (Previously Presented)   The method of claim 49, step (f) further comprises the steps of:

(f.1)   mapping and scaling the error-corrected decoder symbol signal to create a mapped and scaled error-corrected decoder symbol signal;

(f.2)   subtracting operably the equalizer output signal from the mapped and scaled error-

corrected decoder symbol signal to produce the decision error signal related to said

equalized output signal; and

(f.3)   using the symbol reliability signal to scale the decision error signal to form the

reliability-decision directed adaptation signal.

51. (Previously Presented)   The method of claim 44, wherein the received information-bearing

signal is in an ATSC signal.

52. (Previously Presented)   The method of claim 44, wherein the received information-bearing

signal is broadcast as a QAM signal.

53. (Previously Presented)   The method of claim 44, wherein the received information-bearing

signal is broadcast as an offset QAM signal.